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A Systematic Review of Studies on Language Learning Strategies from 1977 to 2018

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This study aims to reveal the extent to which language learning strategies (LLS) are studied, including the changing research trends, the most prominen t scholars working on LLS and the countries in which the articles are based on, citation analysis, global academic collaboration and emerging top research topics. The analysis of the related literature was carried out by employing a bibliometric analysis of the research and review papers indexed in the Web of Science databases: Social Science Citation Index (SSCI), Emerging Sources Citation Index (ESCI), Conference Proceedings Citation Index-Social Sciences and Humanities and Arts & Humanities Citation Index (A&HCI) between 1977 and 2018. In this research, no separation was set from the research of language learning strategy (LLS) use as a native or nonnative language. The results showed that there has been a booming interest in language learning strategy research over time. While the first study appeared in 1977, there were 383 LLS publications, most of which were in the field of education (%68.41) in the Web of Science (WoS) till 2018. The publications included articles, proceedings, book reviews, editorial material, review and meeting abstract. It was found that language learning strategy research focused mostly on individual learner variables such as motivation, gender, proficiency in English as a foreign language while most of those studies were carried out through Strategy Inventory of Language Learning (Oxford, 1990) by quantitative methodology. This is the first study reporting the landscape of global research tendencies and trends in LLS. This study contributes to the understanding of the overall LLS academic research and gives an insight into the past, today and future of the language studies.

Abstract

1. INTRODUCTION

Language learning strategy research emerged for the first time from the studies which attempted to find out the characteristics of good language learners. Researchers sought the features of learners through observations, interviews, diary studies, and various surveys. They assumed that if characteristics of more successful learners can be distinguished from the less successful ones, the performance of the less successful ones can be improved and their learnings can be facilitated (Stern, 1975; Rubin, 1975). These studies were called "good language learner" (GLL) studies which gave birth to language learning strategy research.

Many researchers attempted to define language learning strategies. For example, Oxford defined language learning strategies as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Oxford, 1990). Another researcher, Wenden (1987), approached to strategies as language learning behaviors regulating the meaning of the target language and strategic knowledge of language learners, their motivations and attitudes to

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language learning. Rubin (1987) referred to strategies as the techniques or steps taken to make the learning easier. Rigney (1978) defined language learning strategies as specific actions taken to make learning faster, more self-directed, enjoyable and transferrable which is similar and supportive of the Oxford's approach.

Oxford defined language learning strategies as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective and more transferrable to new situations" (1990). In her classification of strategies, there are two main classes: direct and indirect strategies, each which has three subgroups: memory, cognitive and compensation strategies under direct strategies and metacognitive, affective and social strategies under indirect strategies (See Table 1)

Table 1: Oxford's Direct and Indirect Strategy Groups and Sets

Direct Strategies	Indirect Strategies	
Memory Strategies	Meta-cognitive Strategies	
Cognitive Strategies	Affective Strategies	
Compensation Strategies	Social Strategies	

2. RESEARCH METHODOLOGY

2.1. Aim and Data Collection Method

Language learning strategy studies have gained importance through more than four decades and become one of the prominently sought subject in applied linguistics to find solutions for the in-and out- class foreign language teaching practices and have been helpful for both the language learners in their foreign language learning adventure by mentoring them to be autonomous and teachers to facilitate their students' learning and easing their burdens in foreign language teaching, etc (Razak, Yassin, & Maasum, 2020). However, due to some reasons such as definitional fuzziness of the classification of language learning strategies and the instruments researchers use and multiple strategy use at a time (Dörnyei, 2005), those studies became subject to a growing criticism. Accordingly, Dörnyei (2005), like Skehan in 1989, called for re-theorisation of language learning strategies, and Woodrow (2005) called for moves to more qualitative methods (Rose, 2012). Additionally, Dörnyei (2005), Tseng, Dörnyei and Schmitt (2006) and Woodrow (2005) discussed how language learning strategies are too general, incoherent and definitionally fuzzy and related questionnaires are inaccurate and unreliable. Accordingly, Dörnyei (2005) proposed a new theory to replace language learning strategies based on psychological concept of selfregulation. However, according to Rose (2012), the reconceptualization of language learning strategies might be a matter of throwing the baby out with the bathwater, since it throws out a problematic taxonomy and replaces it with another one, which is also problematic including the same "definitional fuzziness" for which previous taxonomies have been criticized.

No matter how ongoing debates go over around the language learning strategies, it is obvious that strategy studies have opened an important gate on language learning studies and evolved throughout time and seems to continue as a result of the cumulative aspect of the scientific research. The current study aimed to present the landscape of language learning strategy research and show how academically significant role they played in exploring factors in language learning and teaching.

The data were collected from Web of Science due to some reasons. First of all, this database presents a more general and broad categorizations of the disciplines and their sub-disciplines. Its coverage protects its importance in comparison to the field-specific indices. In comparison to other databases, its timely published journals have higher impact factors and referee systems.

Even though, so far, several language related bibliometric studies were carried out, such a topic-based study has not been studied before from bibliometric perspective. This

study differs from the others first of all, with its contribution to the bibliometrics field via an attention-grabbing output of the applied linguistics entirely in WoS. Such a topic-based bibliometric study in applied linguistics hasn't been investigated to that extent. Secondly, this study provides a comprehensive mapping of the language learning strategy (LLS) publications from the very beginning of Web of Science databases which are Social Science Citation Index (SSCI), Emerging Sources Citation Index (ESCI), Conference Proceedings Citation Index-Social Sciences and Humanities and Arts & Humanities Citation Index (A&HCI). In other words, it gives a detailed picture of LLS publication outputs in WoS. Thirdly, this study aims to provide information not only the overall of LLS publications, but also, a detailed pictorial analysis which leads to examine yearly changes of those outputs from scientific perspective over the years.

To sum, this study aims to seek the following objectives by employing bibliometric techniques and utilizing Web of Science and VosViewer 1.6.9 as research tools.

- a. To find out the annual growth-pattern of literature on language learning strategies research,
- b. To explore the Web of Science categories, publication types, languages and key topics studied in language learning strategy research,
- c. To examine the top effective and productive sources, universities and countries in language learning strategy studies,
- d. To investigate top effective and productive authors in language learning strategy research,
- e. To find out the most effective journals, countries, universities and references in language learning strategy research.

According to the research objectives above, research questions of the study are as follows:

- 1. How is the growth pattern in LLS literature?
- 2. What are the Web of Science categories, publication types, languages and key topics studied in LLS literature?
- 3. What are the most productive sources, universities and countries in LLS literature?
- 4. Who are the most cited and productive authors in LLS literature?
- 5. What are the most cited journals, countries, universities, and references in LLS literature?

2.2. Bibliometric Research in General and on Language Studies

Bibliometrics can be defined as the discipline of quantitative perspectives of utilization, production and dissemination of publications (Moed et al, 2004) enabling researchers to explore the impact and research tendencies of the specific scientific field. In other words, it is the statistical analysis of publications to evaluate the quality of scholarly papers, underline the recent developments in the fields of science and technology and measure the impact of the research work generated by individuals, researchers, institutions etc. (Zeidanin et al, 2017). Bibliometric term was coined first time by Alan Pritchard (Pritchard, 1969), however, bibliometric studies date back to 1900s, when, in comparative anatomy, publications between 1543 and 1860 were statistically analyzed (Cole & Eales, 1917). They searched those publications to find out the growth of research in this field and the amount of publications in European countries.

Based on the historical developments in the bibliometric studies, many contributor steps were taken in science and social sciences (e.g. Leydesdorff & Wagner, 2009; Nederhof, 2006; Nederhof, 2011). It is possible to separate those bibliometric studies into a few categories such as journal based, topic based or subject based. According to this categorization, while some researchers focused on a single journal or a comparison of journals published in language studies (e.g. Lei & Liu, 2018a; Lei & Liu, 2018b, Ezema &

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Asogwa, 2014; Meara,2014; Heinzkill, 1980; Egbert, 2007) some researchers analyzed the research trends in language or linguistics studies (e.g. Nederhof, 2011; Arik, 2014; Arik, 2015; Arik & Arik 2015; Silva & Leki, 2004; Meara, 2012; Georgas& Cullars, 2005), while some of those limited this type into a certain period of time or place (e.g. Lei & Liao, 2017; Le & Liu, 2018b, Gong et al, 2018a) and some focused on a single topic, which are highly interested in the literature (e.g. Arik & Arik, 2017; Van Doorslaer & Gambier, 2015; Zanettin et al, 2015; Liao & Lei, 2017). Common points in those studies point out that there is a considerable increase in language related publications over time. Though comparatively low, language related studies gained importance and boomed interest over time. Also, those researchers figure out the need for a qualitative mapping of the field to get a more detailed and intensive implication in the field.

3. DATA ANALYSIS AND FINDINGS

In this study, the bibliometrics was selected as a mainline for the language learning strategy (LLS) studies in the literature because of its nature as a frequent preference for the scholars' scientific communication globally and relatively as a means employed for the scholarly evaluation. For this bibliometric analysis of the current study, one limitation was within the Web of Science databases, thus, Social Science Citation Index (SSCI), Emerging Sources Citation Index (ESCI), Conference Proceedings Citation Index-Social Sciences and Humanities and Arts & Humanities Citation Index (A&HCI) were selected. To gain a comprehensive data and clear search results, topic search query phrases "Language Learning Strategy Use" OR "Language Learning Strategies" OR "Language Strategy" were chosen. In the advanced search section of the Web of Science database, we also included Women's Studies, AND was used as operator and no special field was selected.

For the exclusion criteria, no time span or country limit was taken. Therefore, only studies including those phrases in their titles, abstracts or keywords were retrieved (WoS, 2018).

For defining the variables criteria, since the examination of language learning strategy studies was aimed, following variables were created: the number of publications, the types of publications, research areas, publication years, the names of journals, languages, the number of authors, citations and references, abstracts, and keyword.

All the collected data were examined based on two main groups: *Document analysis* and *citation analysis*. For the document analysis, which covered the year-wise distribution, WoS categories, publication types, languages, and most productive authors, sources, universities and countries except key topics, Web of Science wasemployed. The relevant data were presented in tables. However, for the citation analysis, which included the most cited authors, journals, countries, universities and references, VosViewer program was used. VosViewer 1.6.9 is a software tool developed by van Eck and Waltman (2018) to create maps based on network data and to visualize and explore these maps. To reveal the holistic landscape of this field, VOSviewer as popular free visualization tool was preferred to process the bibliographic data including author, category, reference, and keyword.

For coding and analysis criteria, search results were saved as an Excel file and coded the data accordingly. The saved files included information about the titles of scientific works, authors, names of journals, publication dates, citations, cited references, abstracts, publications' languages, types of documents, keywords, and addresses, among others (i.e., full record and cited references). Titles, abstracts, and keywords were focused to examine the publications' main topics.

By employing these research methods, it was to present a quantitative overall understanding of scientific accumulation of the studies and their contributions on the language learning strategy use among English as a foreign language learners, which can be

assumed one of the cornerstones of scientific travel of language learners, language learning and teaching studies. This kind of understanding will be helpful for the researchers to get an insight scientifically, while teachers and learners may take benefit from the reflections of this scientific insights practically.

3.1. Document Analysis in LLS Literature

3.1.1 Growth Pattern in Language Learning Strategy Literature

This study retrieved 383 items on the language learning strategy studies between 1977 and 2018. First publications on the strategy use came after the growing interest of the definition of good language learner characteristics by Rubin (1975) and Stern (1983) as it is stated previously. Table 1 lists the publications, their percentages and publication years. Maximum number of LLS publications is 49 (% 12.79) in 2016 and 2018. According to table 2, it is obvious that there is a growing interest in the language learning strategy research after 2009 in the WoS.

Table 2: Yearly Growth Pattern in LLS Literature

Year	No of LLS Studies	Percentage	Year	No of LLS Studies	Percentage (%)	Year	No of LLS Studies	Percentage
2018	49	12.79	2006	4	1.04	1993	4	1.04
2017	42	10.97	2005	5	1.31	1991	2	0.52
2016	49	12.79	2004	5	1.31	1990	1	0.26
2015	45	11.75	2003	4	1.04	1989	4	1.04
2014	27	7.05	2002	1	0.26	1988	2	0.52
2013	29	7.57	2001	1	0.26	1987	1	0.26
2012	25	6.53	2000	3	0.78	1986	1	0.26
2011	24	6.27	1999	2	0.52	1985	1	0.26
2010	13	3.39	1997	3	0.78	1984	1	0.26
2009	13	3.39	1996	2	0.52	1981	1	0.26
2008	7	1.83	1995	4	1.04	1977	1	0.26
2007	4	1.04	1994	3	0.78			

3.1.2 Web of Science Categorization of LLS Publications

Web of Science classifies the publications in accordance with the scientific categories such as language linguistics, education educational studies, psychology, psychology multidisciplinary fields, communication, history, etc. Language learning strategy publication categories and their distributions based on the number and percentage are given below in Table 3. In the current study, only categories including more than 5 publications were included, less than five records were excluded. This analysis showed that most of the LLS research was included in education research with 262 records (68,41 %). Second most common WoS category appeared as Linguistics category with 171 publications (44,65%). And third highest record in the categorization fell under that Language Linguistics category with 59 publication records (15,41%). This result indicates/d that researchers are highly interested in the LLS in terms of their educational insights. It may imply the practical use of LLS in language teaching and learning contexts. More than half of the research seems to be related with LLS publications in terms of their instructional problems, practical uses, teacher and learner perspectives, etc.

3.1.3 Top Sources in LLS Research

Table 3: Web of Science Categories in LLS Publications

Web of Science Categories	Publication	Percentage
EDUCATION EDUCATIONAL RESEARCH	262	68.41
LINGUISTICS	171	44.65
LANGUAGE LINGUISTICS	59	15.41
SOCIAL SCIENCES INTERDISCIPLINARY	33	8.62
HUMANITIES MULTIDISCIPLINARY	15	3.92
PSYCHOLOGY EDUCATIONAL	9	2.35
PSYCHOLOGY MULTIDISCIPLINARY	6	1.57

Table 4 shows the top 10 productive journals based on the number of the publication counts in language learning strategy research. Procedia Social and Behavioral Sciences ranked the first with 40 studies which constitutes 10.44% of the overall LLS in literature indexed in Web of Science. Second highest document number belonged to Foreign Language Annals with 23 studies and this built up the 6.01% of the LLS literature. Third is System journal with a very close rate, of 21 studies (5.48%). This result shows that researchers prefer those prominent journals for their LLS productivity.

Table 4: Top Sources in LLS Research

Rank	Source Titles	Number of Documents	Percentage (%)
1	PROCEDIA SOCIAL AND BEHAVIORAL SCIENCES	40	10.44
2	FOREIGN LANGUAGE ANNALS	23	6.01
3	SYSTEM	21	5.48
4	MODERN LANGUAGE JOURNAL	16	4.18
5	LANGUAGE LEARNING JOURNAL	13	3.39
6	LANGUAGE LEARNING TECHNOLOGY	12	3.13
7	HACETTEPE UNIVERSITY JOURNAL OF EDUCATION	9	2.35
8	STUDIES IN SECOND LANGUAGE LEARNING AND TEACHING	9	2.35
9	CANADIAN MODERN LANGUAGE REVIEW REVUE CANADIENNE DES LANGUES VIVANTES	8	2.09
10	ARAB WORLD ENGLISH JOURNAL	7	1.83

3.1.4 Document Types in LLS Studies

Of the 383 LLS studies of the Web of Science LLS literature in our dataset, it was found that 258 were articles, 105 were proceedings papers, 16 were book reviews, 6 were editorial materials, 4 were reviews and 1 was meeting abstract (See Table 5). Articles had the highest rate with 258 (67.36%) while the least rate was of meeting abstract (0.26%).

Table 5: Publication Types in LLS Research

Rank	Rank Document Types Publication Perc. (%				
Kank	Document Types	Publication	Perc. (%)		
1	ARTICLE	258	67.36		
2	PROCEEDINGS PAPER	105	27.42		
3	BOOK REVIEW	16	4.18		
4	EDITORIAL MATERIAL	6	1.57		
5	REVIEW	4	1.04		
6	MEETING ABSTRACT	1	0.26		

3.1.5 Languages in LLS Literature

Table 6 presents the languages studied in LLS research. English is the top language, which may hint the international power of English in scientific platforms. Even though the

countries and organizations differ in interest of seeking the strategy learning in language studies, worldly scientific contribution has been maintained for years. Most of the LLS 358 studies was found to be carried out in English language which was followed with Spanish language through 7 studies and 4 studies in Turkish languages.

Other languages studied were Chinese, French, Japanese, Portuguese, Croatian, Estonian, German, Malay, Russian and Slovenian. The dominance of English as a foreign language from many aspects may be observed in the current study as well. In other words, all over the world, highly increasing interest for English as a foreign language is reflected in LLS publications, too.

Table 6: Languages in LLS Research

Rank	Field: Languages	Record Count	Percentage (%)
1	ENGLISH	358	93.47
2	SPANISH	7	1.83
3	TURKISH	4	1.04
4	CHINESE	2	0.52
5	FRENCH	2	0.52
6	JAPANESE	2	0.52
7	PORTUGUESE	2	0.52
8	CROATIAN	1	0.26
9	ESTONIAN	1	0.26
10	GERMAN	1	0.26
11	MALAY	1	0.26
12	RUSSIAN	1	0.26
13	SLOVENIAN	1	0.26

3.1.6 Top Productive Universities in LLS Research

The examination of the affiliations of the researchers in LLS study productivity showed that top universities were Islamic Azad University with 17 studies, followed by Aristotle University, Griffith University, University of Maryland with 6 studies for each, Adam Mickiewicz University, Hacettepe University, State University of Applied Sciences and University of Alabama with 5 studies for each, Democritus University of Thrace, Indiana University and Penn State University with 4 studies for each and finally Abant İzzet Baysal University with 3 LLS studies (See Table 7).

Table 7: Top Universities in LLS Research

Rank	Field: Organizations	Number of Publications	Percentage (%)
1	ISLAMIC AZAD UNIVERSITY	17	4.44
2	ARISTOTLE UNIVERSITY OF THESSALONIKI	6	1.57
3	GRIFFITH UNIVERSITY	6	1.57
4	UNIVERSTIY OF MARYLAND	6	1.57
5	ADAM MICKIEWICZ UNIVERSITY	5	1.31
6	HACETTEPE UNIVERSITY	5	1.31
7	STATE UNIVERSITY OF APPLIED SCIENCES	5	1.31
8	UNIVERSITY OF ALABAMA	5	1.31
9	DEMOCRITUS UNIVERSITY OF THRACE	4	1.04
10	INDIANA UNIVERSITY	4	1.04
11	PENN STATE UNIVERSITY	4	1.04
12	ABANT IZZET BAYSAL UNIVERSITY	3	0.78

3.1.7 Top Productive Countries in LLS Research

Table 8 presents the productivity rate of the top 15 countries in terms of LLS research. In terms of the LLS research productivity, USA was on the top with 63 studies (%16.45), followed by Turkey with 38 (%9.92) and Iran with 37 studies (%9.66) as the most productive three countries in language learning strategy research.

Table 8: Top Countries in LLS Research Productivity

Rank	Field: Countries/Regions	Publication	Percentage (%)
1	USA	63	16.45
2	TURKEY	38	9.92
3	IRAN	37	9.66
4	PEOPLE'S REPUBLIC OF CHINA	36	9.40
5	SPAIN	21	5.48
6	ENGLAND	19	4.96
7	AUSTRALIA	17	4.44
8	MALAYSIA	16	4.18
9	TAIWAN	16	4.18
10	JAPAN	10	2.61
11	CANADA	8	2.09
12	GREECE	8	2.09%
13	ROMANIA	7	1.83%
14	SAUDI ARABIA	7	1.83%
15	SOUTH AFRICA	7	1.83%

3.1.8 Top Productive Authors in LLS Research

It is possible to analyze the author information of the LLS publications based on their published studies by employing via Web of Science. The LLS analysis showed that the top author was Rebecca Oxford with 972 citations (See Figure 5) in 15 studies in WoS. According to Table 11, it is obvious that Oxford's leading studies, particularly Taxonomy of Strategy of Language Learning and relevantly her Strategy Inventory of Language Learning to measure the use of strategies have been primarily effective on this result. She was followed by Mirosław Pawlak with 5 studies and each of the following authors had 3 studies in Web of Science LLS literature. (See Table 9).

Table 9: Top productive authors in LLS research

Rank	Field: Authors	Number of Publications	Percentage (%)
1	OXFORD REBECCA	15	3.92
2	PAWLAK MIROSŁAW	5	1.31
3	AFSHAR HASAN SOODMAND	3	0.78
4	ARDASHEVA YULIVA	3	0.78
5	CATELLY YOLANDA-MIRELA	3	0.78
6	EHRMAN MADELINE	3	0.78
7	GAVRIILIDOU ZOE	3	0.78
8	GRIFFITHS CAROL	3	0.78
9	HABOK ANITA	3	0.78
10	HAJAR ANAS	3	0.78
11	LIYANAGE INDIKA	3	0.78
12	NYIKOS MARTHA	3	0.78

3.1.9 Top Topics Studied in Relation to Language Learning Strategies

Scientific LLS landscape of main research areas based on the co-occurrence from the retrieved 383 LLS research was shown in the Figure 1. The most noticeable research areas in

relation with LLS studies based on the author keywords in Web of Science and their yearly distribution in colors were shown via VosViewer. The most frequent keywords that cooccurred at least 7 times in 383 studies were figured. The most important research keywords in five clusters were "language learning strategies, students, proficiency, motivation, gender, classroom, foreign language, university students, instruction, beliefs, performance, strategy instruction, context, metacognitive strategies, self-regulation, self-efficacy, strategy inventory for language learning, English as a foreign language, vocabulary learning strategies, learner autonomy etc." This finding is relevant with the most cited LLS research analysis (See Table 12). Language learning strategies or learning strategies as the core keyword in the studies, individual difference variables constitute most of the research areas in literature. This cooccurrence of the key words gives us an insight about how educational or in-class concerns in language strategy use are highly investigated. Individual differences of the language learners appear to have been scrutinized in detail through those research. As a keyword in these studies "Strategy inventory for language learning (SILL)" is the most prominent and popular tool used, even though there are some other strategy inventories developed. This inventory is used for the English as a foreign language learners. Even though, there is no separation set for the native or non-native language learners, the dominance of the SILL shows that English as an international language and its strategic ways are popularly sought. Figure 1 also presents the yearly co-occurrence distribution of the keywords in the dataset.

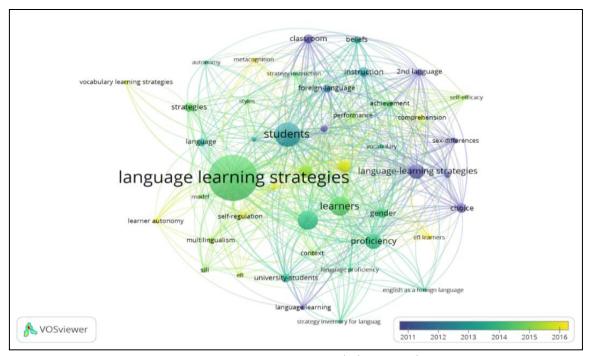


Figure 1. Most Frequent Keywords in LLS Literature

3.2. Citation Analysis in LLS Literature

3.2.1 Top Cited Journals in LLS Literature

In terms of scientific effectiveness of the studies in literature, which was evaluated based on the citation analysis of the journals of LLS research, more or less similar journals appeared in the list (See Table 10). Accordingly, Modern Language Journal made the highest impact (879 citations in 16 studies) in literature of LLS research, which was followed by Foreign Language Annals (491 citations in 23 studies) and Language Learning (307 citations in 5 studies). Scientific impact of the LLS research might be observed via this table. There seems a relevance with the top productive journals to some extent. Figure 2 also presents top cited journal distribution of the LLS literature.

Rank	Source	Publication	Citation
1	Modern Language Journal	16	879
2	Foreign Language Annals	23	491
3	Language Learning	5	307
4	TESOL Quarterly	3	270
5	Applied Linguistics	5	242
6	System	21	169
7	Canadian Modern Language Review	8	65
8	Hacettepe University Education Faculty Journal	9	15
9	International Journal of Bilingual Education	3	13
10	Language Learning Journal	13	10

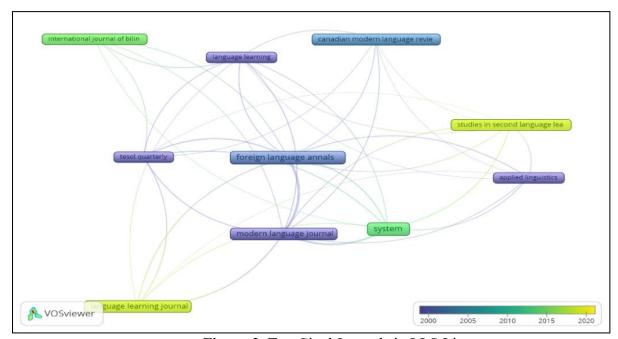


Figure 2. Top Cited Journals in LLS Literature

3.2.2 Top Cited Publications in LLS Literature

In this study, to understand the extent of the LLS studies, citation analysis was carried. Table 11 shows the top 15 frequently LLS studies. They were all journal articles. The most cited article was published by Oxford and Nyikos entitled "Variables affecting choice of language learning strategies by university students" in Modern Language Journal in 1989. The high impact of the Modern Language Journal was shown in Table 10. This study was followed by Green and Oxford's publication "A closer look at L2 strategies: L2 proficiency and gender" in TESOL Quarterly. This analysis provides a broad insight about how effective Rebecca Oxford and her leading role in LLS research. Tseng, Dörnyei and Schmitt's "A new approach to assessing strategic learning: The case of self-regulation in vocabulary acquisition" published in Applied Linguistics Journal. This restarted a debate upon the LLS concept and its definitional problems. Among top cited LLs studies, intensive interest on the individual differences and language learning strategy use relationship remarkable no matter year-wise distribution is not normalized. In other words, the interest in individual differences and LLS is obvious in the last 3 decades.

Table 11. Top-cited LLS Studies

Table	11. Top-cited L	LS Studie	ės	,	
Rank	Author/s	Year	Publication	Journal	Citation
	Oxford, R. & Nyikos, M.	1989	Variables affecting choice of language learning strategies by university students	Modern Language Journal	240
2	Green, JM & Oxford, R.	1995	A closer look at L2 strategies: L2 proficiency and gender	TESOL Quarterly	238
3	Tseng, WT, Dörnyei, Z & Schmitt, N.	2006	A new approach to assessing strategic learning: The case of self-regulation in vocabulary acquisition	Applied Linguistics	165
4	Donato,R. & Mccormick, D.	1994	A sociocultural perspective on language learning strategies: the role of mediation	Modern Language Journal	117
5	Wharton, G.	2000	Language learning strategy use of bilingual foreign language learners in Singapour	Language Learning	116
6	Ehrman, M. & Oxford, R.	1989	Effects of sex differences, career choice and psychological type on adult language learning strategies	Modern Language Journal	96
7	Hsiao, TY& Oxford, R.	2002	Comparing theories of language learning strategies: A confirmatory factor analysis	Modern Language Journal	93
8	Oxford, R. & Crookall, D.	1989	Research on language learning strategies: Methods, findings and instructional issues	Modern Language Journal	85
9	Plonsky, L.	2011	The effectiveness of second language learning strategies instruction: A meta-analysis	Language Learning	75
10	Park, GP	1997	Language learning strategies and English proficiency in Korean university students	Foreign Language Annals	59
11	Oxford, R, Nyikos, M. & Ehrman, M.	1988	Vive-la-difference: reflections on sex differences in use of language learning strategies	Foreign Language Annals	48
12	Nyikos, M. & Oxford, R.	1993	A factor analytic study on language learning strategy use: Interpretations from information-processing theory and social-psychology	Modern Language Journal	45
13	Macintyre, PD & Noels, KA	1996	Using social psychological variables to predict the language learning strategies	Foreign Language Annals	41
14	Griffiths, C. & Oxford, R.	2014	The twenty first century landscape of language learning strategies: Introduction to this special issue	System	39
15	Oxford, R, Lavine, RZ & Crookall, D.	1989	Language learning strategies, communicative approach and their classroom implications	Foreign Language Annals	32

Figure 3 presents the visualization of the authors of the top cited publications in LLS literature in 4 colored clusters according to the year-wise distribution of the publications listed in Table 12.

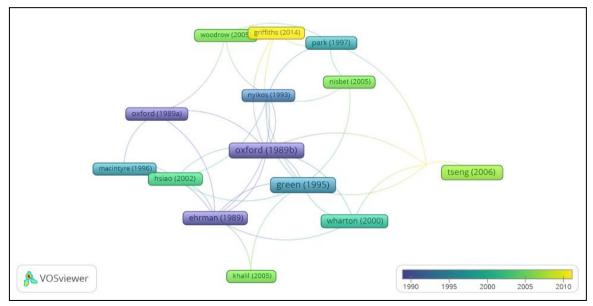


Figure 3: Top Cited Publications in LLS Literature

3.2.3 Top Cited Universities in LLS Literature

Table 12 shows the interest and citation rate of the scholars according to their affiliated scientific organizations. Accordingly, the most effective university in LLS research is University of Alabama with 306 citations, followed by Indiana University with 292 citations, University of Nottingham with 165 citations, Nanyang Technological University with 144 citations etc. As it is seen, the number of the studies doesn't provide a clear understanding on the impact of the study. However, citation analysis shouldn't be taken as the sole criteria to examine the underlying reasons behind impact of a research.

Table 12. Top Cited Universities in LLS Research

Rank	Organization	Publications	Citation
1	University of Alabama	3	306
2	Indiana University	3	292
3	University of Nottingham	1	165
4	Nanyang Technological University	3	144
5	University of Maryland	6	137
6	National Taiwan Ocean University	3	97
7	University of Sydney	3	71
8	Oxford Associates	3	55
9	Fatih University	3	44
10	Islamic Azad University	17	19
11	University of Autonoma Barcelona	3	15
12	University of Barcelona	2	15
13	University of Auckland	2	13
14	State University of Applied Sciences	5	4
15	University of Malaga	2	3

Figure 4 below maps the top cited universities in LLS literature in three colored clusters. Accordingly, top university in LLS research efficiency, Indiana University is indicated in blue, which is the representative color of the studies of beginning years of 1990s. Second efficient university, Alabama University, is shown in purple, which represents the distributive years between 1995 and 2000. Moreover, green indicates the studies published between 2000 and 2010 and yellow between 2010 and 2018.

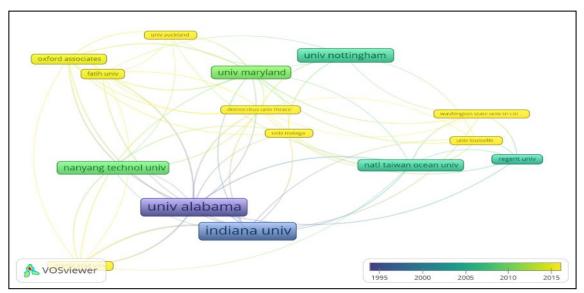


Figure 4:Top Cited Universities in LLS Literature

3.2.4 Top Cited Authors in LLS Literature

Table 13 shows the top cited authors in LLS research based on the number of citations and year-wise distribution in Web of Science. In this analysis, the citations out of the Web of Science databases were excluded. In other words, the scientific communication of the language learning strategy researchers solely in Web of Science was given in this table. The most cited author is Rebecca Oxford who introduced one of the best known language learning strategy taxonomy to the literature. In total, she had 972 citations in 15 studies in Web of Science. She was followed by Martha Nyikos with 333 citations in her 3 publications. Third place belonged to John Green with 238 citation in one publication. While some authors ranked in this list alone, some of the authors' one publication could find place in this list such as such as Wen-Ta Tseng, Zoltan Dörnyei and Norbert Schmitt, Richard Donato and Dawn MacCormick etc.

Table 13. Top Cited Authors in LLS Literature in WoS

Authors	Citations	Documents
Oxford, Rebecca	972	15
Nyikos, Martha	333	3
Green, John M.	238	1
Tseng Wen-Ta, Dörnyei Zoltan & Schmitt Norbert	165	1
Ehrman, Madeline	161	3
Peters, Ann	129	1
Crookal, David	117	2
Donato, Richard & MacCormick Dawn	117	1
Wharton, Glenn	116	1
Hsiao, Tsung Yuan	95	2
Plonsky, Luke	92	3
Danan, Martine	89	1
Macintyre, Peter	65	2
Park, Gi Pyo	59	1
Nisbet Deanna, Tindall Evie & Arroya Alan	52	1
Phakiti, Aek	49	1
Nakatani, Yasuo	45	1
Griffiths, Carol	44	3

Noels Kim	41	1
Rose, Heath	41	1
Zhang, Lawrence Jun	40	3

Figure 3 below has 3 main clusters of frames in 3 different colors: purple to indicate effective authors of publications at the beginning of the 1990s, green to indicate authors of publications between 2000 and beginning of 2010s and yellow to indicate the authors of publications after between the beginning years of 2010s till 2018. VosViewer figure presents the more effective authors in bigger frames and thicker links to the other authors, while the less effective ones have smaller frames and thinner links. In this figure, Oxford is most visible author followed by Ehrman, Nyikos and Green in purple colors etc. This finding is relevant with the "SILL" popularity in the key word co-occurrence analysis. SILL was created by Oxford and made a big impact on quantitative studies particularly.

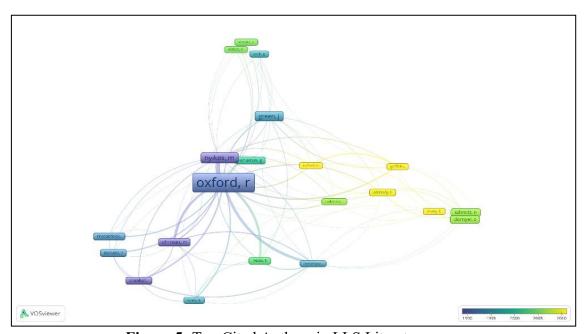


Figure 5: Top Cited Authors in LLS Literature

3.2.5 Top Cited References in LLS Literature

Table 14 shows the examination of the top references in carrying out the LLS based on the citation counts. According to this table, cited references are grouped into two groups: books and journal articles. The most cited reference is Oxford's "Language Learning Strategies: What Every Teacher Should Know", which introduced the language learning strategies taxonomy and "Strategy Inventory for Language Learning". It seems that this study played a road map role in the language strategy research. Following this study, O'Malley's "Learning Strategies in SLA" book made the most important impact on the literature. Third most important publication was published by Rubin in 1975. This study was the first one in literature that opened the gate in language strategy studies by seeking the characteristics of good language learner and asking "who is good language learner?" question for the first time. It led both directly and indirectly to a booming interest in language strategy research. The map of the top references can also be seen in Figure 6. Accordingly, early pioneering studies of LLS research, "Good Language Learner (GLL)" studies are shown in blue, green framed studies which were published as books seem to be the essentials for LLS researchers.

Table 14. Top Cited References

	1	Type	
		of	Cit
Rank	Cited References	Publ.	s.
1	Oxford R., 1990, Language Learning Strategies: What Every Teacher Should Know	Book	223
2	Omalley J. M., 1990, Learning Strategies in SLA	Book	130
3	Rubin J, 1975, TESOL Quarterly, v9, p41, doi 10.2307/3586011	Article	95
4	Green JM, 1995, TESOL Quarterly, v29, p261, doi 10.2307/3587625	Article	82
5	Oxford R, 1989, Modern Language Journal, v73, p291, doi 10.2307/327003	Article	80
	Cohen A.D., 1998, Strategies Learning and Using a Second Language, Harlow,	Book	
6	Longman		67
	Omalley JM et al, 1985, Language Learning, v35, p21, doi 10.1111/j.1467-	Article	
7	1770.1985.tb01013.x		47
8	Dörnyei Z., 2005, Psychology of Language Learning	Book	47
	Griffiths c, 2003, System, v31, p367, doi [10.1016/s0346-251x(03)00048-4, doi	Article	
9	10.1016/s0346-251x(03)00048-4]		46
10	Burry-stock j. A, 1995, System, v23, p1, doi 10.1016/0346-251x(94)00047-a	Article	44
11	Oxford Rebecca 1., 2011, Teaching and Researching Language Learning Strategies	Book	43
12	Ellis R, 1994, The Study of Second Language Acquisition	Book	43
13	Wharton G, 2000, Language Learning, v50, p203, doi 10.1111/0023-8333.00117	Article	38
14	Stern H. H., 1975, Canadian Modern Language, v31, p304	Article	38
15	Politzer rl, 1985, TESOL Quarterly, v19, p103, doi 10.2307/3586774	Article	32

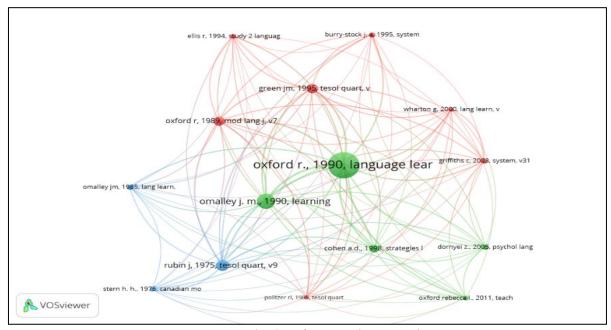


Figure 6. Top Cited References in LLS Literature

4. CONCLUSION AND DISCUSSION

In this study, 383 LLS related publications as indexed in *Social Science Citation Index (SSCI)*, Emerging Sources Citation Index (ESCI), Conference Proceedings Citation Index-Social Sciences and Humanities and Arts & Humanities Citation Index (A&HCI) of Web of Science. Starting from 1977 till 2018, there is a steady increase in LLS publications. This leads the expectation of greater increase in LLS literature in the near future. The most effective publications appeared at the beginning of 1990s, in which particularly Rebecca Oxford's contributions seem to play an essential role with her introduction of the taxonomy of language learning strategy and strategy inventory of language learning to literature.

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However, her contributions continue as single and collaborating authors as well. She is the most prolific researcher without any discussion.

Various types of bibliometric information about the language learning strategy research were examined from the very beginning till 2018 and the evolving trends of the most popular topics, efficient and productive journals, countries, universities and authors contributing in LLS literature. The results show that regarding the LLS related studies, overwhelming interest among the researchers has been on the individual /learner differences.

Data showed that top journals were Modern Language Journal, Foreign Language Annals and Language Learning Journal in order based on citations, while Procedia Social and Behavioral Sciences, Foreign Language Annals and System were the most productive sources.

Moreover, the most productive countries in LLS literature were USA, Turkey and Iran. English language was the most studied language in LLS and Islamic Azad University was the most productive university. However, publications from Indiana and Alabama universities were the most efficient one in literature.

This study had some limitations. For example, in data analysis, "Language Learning Strategies", "Language Strategy" and "Language Learning Strategy Use" were the search queries in titles, keywords and abstracts. However, it may be possible to find research without those search queries. In both citation and document analysis, findings were retrieved from the Web of Science. In other words, the publications indexed and cited in other databases were excluded, but Web of Science, a common limitation in bibliometric studies of social sciences and humanities (Archambault & Larivière, 2010).

Based on the mapping of the language learning strategy research landscape above, it is seen how important role they played in literature and contributed to academic fields. Taken the harsh criticism into consideration, rather than discarding the relevant literature, it seems better to keep in mind how cumulative and evolving aspect of scientific research is significant and additionally, look beyond the current challenges. Therefore, it is suggested to continue carrying out research on language learning strategy based on the evolving learner, teacher needs and educational settings etc. by differing research methods and seeking for ways to minimize the challenges of definitional fuzziness and maximize in-depth analysis of the strategic behaviors of the learners.

It is hoped that the current study will be helpful for EFL researchers, teachers, and students alike. Since this study only focused on WoS publications, it might be wise to avoid of generalizations based on only these findings. According to Archambault and Lariviere, this is one of the common limitations of bibliometric studies in social sciences and humanities (2010). For example, Georgas and Cullars (2005) found similar findings in their analysis of citation patterns in linguistics publications indexed in Linguistics and Language Behavior Abstracts (LLBA) of ProQuest and those and social sciences or humanities or natural sciences.

The past and present of the Language Learning strategy research can also be further examined closely investigating the specific journals that frequently publish LLS studies such as Procedia Social and Behavioral Sciences, Foreign Language Annals, System, Language Learning, Modern Language Journal etc. (Table 4) as well as the authors most frequently publish LLS studies and frequently cited such as Oxford, Nykos, Green, Tseng Wen-Ta, Dörnyei Zoltan & Schmitt etc. (Table 13). Additionally, new future trends can be investigated over time. Since the current study presented quantitative data, it is also recommended to carry out such a bibliometric study together with a content analysis to catch more depth in LLS research in various databases other than WoS.

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